Package ‘smoothy’
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Type Package

Title Automatic Estimation of the Most Likely Drug Combination using Smooth Algorithm

Version 1.0.0


License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.2.3

Depends R (>= 4.3)

Imports dplyr, tidyr (>= 1.3.0), zoo (>= 1.8), stringr

LazyData true

Suggests knitr, rmarkdown, ggplot2, gridExtra

VignetteBuilder knitr

NeedsCompilation no

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R topics documented:

```
  drugstreatment .................................................. 2
  smooth_algorithm .................................................. 2
  smooth_deparse .................................................... 3
  smooth_diff ....................................................... 5
  smooth_parse ...................................................... 6
```
drugstreatment  Drug Administration Data

Description
This dataset contains information about drug administration. Each row represents a unique drug administration event.

Usage
drugstreatment

Format
A data frame with the following columns:

- id  Unique identifier for each drug administration event.
- start_date  The start date of drug administration.
- end_date  The end date of drug administration.
- drug  The name of the drug administered.

Examples
```
data("drugstreatment")
head(drugstreatment)
```

smooth_algorithm  Apply Smooth Algorithm in a Dataset

Description

Description part

Usage
smooth_algorithm(id, treatment, day, N, width = 61)

Arguments

```
    id  Unique identifier of the patient.
    treatment  Name of the drug used.
    day  Day of the treatment.
    N  Number of drugs used in the treatment.
    width  An integer specifying the window width (in numbers of days, 61 by default).
```
smooth_deparse

Value

A data.frame with the following structure:

- **id**  A character vector representing the unique identifier for each patient.
- **day**  A character vector representing the date when the treatment was administered to the patients.
- **treatment**  A character vector representing the type of treatment given to each patient.
- **smoothed_treatment**  A character vector representing the smoothed treatment given to each patient.

Examples

```r
library(smoothy)
library(dplyr)

data(drugstreatment)
df <- drugstreatment |> filter(id == "01f13c15-d9f1-4106-a04f-976c457edd0a")

structured_df <- smooth_parse(
  id = df$id,
  start_date = df$start_date,
  end_date = df$end_date,
  drug = df$drug,
  study_from = "1970-01-01",
  study_to = "1975-01-01"
)

head(structured_df)

id = structured_df$id

treatment = structured_df$treatment

day = structured_df$day

N = structured_df$N

width = 61

smoothed <- smooth_algorithm(id = id, treatment = treatment, day = day, N = N, width = width)

head(smoothed)
```

Deparse

Transforms the Data with a Row by Date to a Row by Individual.
Usage

smooth_deparse(id, day, treatment)

Arguments

id Unique identifier of the patient.
day Day of the treatment.
treatment A character vector representing the type of treatment given to each patient.

Value

A data.frame with the following structure:

id A character vector representing the unique identifier for each patient.
start_date Start date of the treatment.
end_date End date of the treatment.
treatment A character vector representing the type of treatment given to each patient.

Examples

library(smoothy)
library(dplyr)
data(drugstreatment)

my_data <- filter(drugstreatment, id == "01f13c15-d9f1-4106-a04f-976c457edd0a")

structured_df <- smooth_parse(
  id = my_data$id,
  start_date = my_data$start_date,
  end_date = my_data$end_date,
  drug = my_data$drug,
  study_from = "1970-01-01",
  study_to = "1975-01-01"
)

head(structured_df)

id = structured_df$id
treatment = structured_df$treatment
day = structured_df$day
N = structured_df$N
width = 61

smoothed <- smooth_algorithm(id = id, treatment = treatment, day = day, N = N, width = width)

head(smoothed)

deparsed_treatment <- smooth_deparse(smoothed$id, smoothed$day, smoothed$treatment)
smooth_diff <- smooth_deparse(smoothed$id, smoothed$day, smoothed$smoothed_treatment)

---

### smooth_diff  
Compute the Difference Between Initial and Smoothed Treatment

**Description**

This function computes the differences between the initial treatment and the treatment when it’s smoothed.

**Usage**

```r
smooth_diff(treatment, smoothed_treatment)
```

**Arguments**

- `treatment`  
  A character vector containing the original treatment data.

- `smoothed_treatment`  
  A character vector containing the smoothed treatment return by `smooth_algorithm` function.

**Value**

A data.frame with three columns: `diff_type`, `diff`, `change` and `treatment`:

- `type` A character vector representing indicating the type of difference computed.
- `days_changed` The number of different items.
- `proportion_of_change` The proportion of difference computed as number of different rows over number of rows.
- `treatment` A character vector representing the type of treatment given to each patient.

**Examples**

```r
library(smoothy)
library(dplyr)

data(drugstreatment)

my_data <- filter(drugstreatment, id == "01f13c15-d9f1-4106-a04f-976c457edd0a")

structured_df <- smooth_parse(
  id = my_data$id,
  start_date = my_data$start_date,
  end_date = my_data$end_date,
  drug = my_data$drug,
  study_from = "1970-01-01",
)```
smooth_parse

Transform Data to be Used in smooth_algorithm() Function

Description

This function transforms the data to obtain the daily treatment.

Usage

smooth_parse(
  id,
  start_date,
  end_date,
  drug,
  study_from = min(start_date),
  study_to = max(end_date)
)

Arguments

id  Unique identifier of the patient.
start_date  Start date of the treatment.
end_date  End date of the treatment.
drug  Name of the drug used.
study_from  A date indicating when the study start.
study_to  A date indicating when the study finish.
Value

A data.frame with the following structure:

- **id**: Unique identifier of the patient.
- **drug**: Name of the drug used.
- **day**: Day of the treatment.
- **N**: Number of drugs used in the treatment.

Examples

```r
library(smoothy)
library(dplyr)

data(drugstreatment)

df <- drugstreatment |> 
  filter(id == "01f13c15-d9f1-4106-a04f-976c457edd0a")

structured_df <- smooth_parse(
  id = df$id,
  start_date = df$start_date,
  end_date = df$end_date,
  drug = df$drug,
  study_from = "1970-01-01",
  study_to = "1975-01-01"
)

head(structured_df)
```
Index

* data
  drugstreatment, 2

drugstreatment, 2

smooth_algorithm, 2
smooth_deparse, 3
smooth_diff, 5
smooth_parse, 6